What is claimed is:

1. An optical fiber for attenuating optical signal, including a core and a cladding wherein n (n.2) kinds of dopants are added for attenuating optical signal,

wherein the concentration Wj (j=1, 2, 3, ..., n) is adjusted, with respect to wavelength .i (i=1, 2, ..., m; m.2), as meeting the following expressions 1 and 2.

Expression 1:

$$0.9 < \frac{\alpha(\lambda_i)}{\alpha(\lambda_k)} < 1.1$$

Expression 2:

$$\alpha(\lambda_i) = \sum_{j=1}^{n} W_j \, A_j(\lambda_i)$$

.i, is a wavelength of optical signal used in optical communication system;

.(.i), is an attenuation amount of optical fiber for attenuating optical signal with respect to optical signal with wavelength.i

K is a positive integral number;

(K=1, 2, ..., m) and (k≠),

Wj, is a concentration of dopant j;

Aj(.i) is an attenuation of optical fiber for attenuating optical signal with respect to

the optical signal with wavelength.i and the attenuation Aj(.i) is produced by the dopant j of one unit.

2. The optical fiber for attenuating optical signal according to Claim 1,

wherein said dopants comprise at least two kinds of transitional metals selected from Co, Ni, Cr, V, Fe, Mn, Tb and Tm.

3. The optical fiber for attenuating optical signal according to Claim 2,

wherein the doped area (cladding) said dopant is doped is about six times area of the core around the core as a center.

4. The optical fiber for attenuating optical signal according to Claim 2,

wherein said wavelength .i of optical signal is in a range of 1200-1700 nm.

5. The optical fiber for attenuating optical signal according to Claim 4,

wherein said wavelengths .i of optical signal are 1310 nm and 1550 nm.

6. The optical fiber for attenuating optical signal according to Claim 4,

said fiber for attenuating optical signal, with respect to said wavelengths .i of optical signal, operates in single mode.

7. The optical fiber for attenuating optical signal according to Claim 2,

said fiber for attenuating optical signal, with respect to said wavelengths .i of optical signal, operates in single mode.

8. The optical fiber for attenuating optical signal according to Claim 2,

wherein, in said doped area, the distribution of said dopant is not uniform along the radius direction of said optical fiber.

9. The optical fiber for attenuating optical signal according to Claim 2,

wherein, the dopant enabling the absorption of optical signal to increase with the wavelength become long, and the dopant enabling the absorption of optical signal to decrease with the wavelength become long, is simultaneously added.

10. The optical fiber for attenuating optical signal according to Claim 1,

wherein the doped area (cladding) said dopant is doped is about six times area of the core around the core as a center.

11. The optical fiber for attenuating optical signal according to Claim 10

wherein said wavelength .i of optical signal is in a range of 1200-1700 nm.

12. The optical fiber for attenuating optical signal according to Claim 11

wherein said wavelengths .i of optical signal are 1310 nm and 1550 nm.

13. The optical fiber for attenuating optical signal according to Claim 12,

said fiber for attenuating optical signal, with respect to said wavelengths .i of optical signal, operates in single mode.

14. The optical fiber for attenuating optical signal according to Claim 11,

said fiber for attenuating optical signal, with respect to said wavelengths .i of optical signal, operates in single mode.

15. The optical fiber for attenuating optical signal according to Claim 10,

said fiber for attenuating optical signal, with respect to said wavelengths .i of optical signal, operates in single mode.

16. The optical fiber for attenuating optical signal according to Claim 15,

wherein said dopants are at least two kinds of transitional metals selected from Co, Ni, Cr, V, Fe, Mn, Tb and Tm.

17. The optical fiber for attenuating optical signal according to Claim 10,

wherein, in said doped area, the distribution of said dopant is not uniform along the radius direction of said optical fiber.

18. The optical fiber for attenuating optical signal according to Claim 10,

wherein, the dopant enabling the absorption of optical signal to increase with the wavelength become long, and the dopant enabling the absorption of optical signal to decrease with the wavelength become long, is simultaneously added.

19. The optical fiber for attenuating optical signal according to Claim 1,

wherein said wavelength .i of optical signal is in a range of 1200-1700 nm.

20. The optical fiber for attenuating optical signal according to Claim 19,

wherein said wavelengths .i of optical signal are 1310 nm and 1550 nm.

21. The optical fiber for attenuating optical signal according to Claim 1,

said fiber for attenuating optical signal, with respect to said wavelengths .i of optical signal, operates in single mode.

22. The optical fiber for attenuating optical signal according to Claim 1,

wherein, in said doped area, the distribution of said dopant is not uniform along the radius direction of said optical fiber.

23. The optical fiber for attenuating optical signal according to Claim 1,

wherein, the dopant enabling the absorption of optical signal to increase with the wavelength become long, and the dopant enabling the absorption of optical signal to decrease with the wavelength become long, is simultaneously added.